Patent claims

1. A process for the fermentative preparation of L-amino acids, in particular L-threonine, which comprises carrying out the following steps:

   a) fermentation of the microorganisms of the Enterobacteriaceae family which produce the desired L-amino acid and in which at least the poxB gene or nucleotide sequences which code for it are attenuated, in particular eliminated,

   b) concentration of the L-amino acid in the medium or in the cells of the bacteria and

   c) isolation of the L-amino acid.

2. A process as claimed in claim 1, which comprises employing microorganisms in which further genes of the biosynthesis pathway of the desired L-amino acid are additionally enhanced.

3. A process as claimed in claim 1, which comprises employing microorganisms in which the metabolic pathways which reduce the formation of the desired L-amino acid are at least partly eliminated.

4. A process as claimed in claim 1, which comprises attenuating, in particular eliminating, expression of the polynucleotide(s) which code(s) for the poxB gene.

5. A process as claimed in claim 1, which comprises reducing the regulatory and/or catalytic properties of the polypeptide (enzyme protein) for which the polynucleotide poxB codes.

6. A process as claimed in claim 1, which comprises fermenting, for the preparation of L-amino acids, microorganisms of the Enterobactericeae

[sic] family in which one or more genes chosen from the group consisting of:

6.1 the thrABC operon which codes for aspartate kinase, homoserine dehydrogenase, homoserine kinase and threonine synthase,

6.2 the pyc gene which codes for pyruvate carboxylase,

6.3 the pps gene which codes for phosphoenol pyruvate synthase,

6.4 the ppc gene which codes for phosphoenol pyruvate carboxylase,

6.5 the pntA and pntB genes which code for transhydrogenase,

6.6 the rhtB gene which imparts homoserine resistance,

6.7 the mqo gene which codes for malate:quinone oxidoreductase,

6.8 the rhtC gene which imparts threonine resistance, and

6.9 the thrE gene which codes for threonine export

is or are amplified, in particular over-expressed, at the same time.

7. A process as claimed in claim 1, w h i c h c o m p r i s e s fermenting, for the preparation of L-amino acids, microorganisms of the Enterobacteriaceae family in which one or more genes chosen from the group consisting of:

7.1 the tdh gene which codes for threonine dehydrogenase,

7.2 the mdh gene which codes for malate dehydrogenase,

7.3 the gene product of the open reading frame (orf) yjfA,

7.4 the gene product of the open reading frame (orf) yjfP,

is or are attenuated, in particular eliminated or reduced in expression, at the same time.

8. A microorganism of the Enterobacteriaceae family which produces L-amino acids, in which the poxB gene or nucleotides sequences which code for it are attenuated, in particular eliminated, and which have a resistance to α-amino-β-hydroxyvaleric acid and optionally a compensatable partial need for L-isoleucine.

9. The Escherichia coli K-12 strain MG442ΔpoxB deposited at the Deutsche Sammlung für Mikroorganismen und Zellkulturen (DSMZ = German Collection of Microorganisms and Cell Cultures, Braunschweig, Germany)(sic)

10. The plasmid pMAK705ΔpoxB, which contains parts of the 5' and of the 3' region of the poxB gene, corresponding to SEQ ID No. 3 shown in figure 1.

11. An isolated polynucleotide from microorganisms of the Enterobactericeae [sic] family, containing a polynucleotide sequence which codes for the 5' and 3' region of the poxB gene, shown in SEQ ID No. 4, in particular suitable as a constituent of plasmids for position-specific mutagenesis of the poxB gene.

12. A strain of the Enterobacteriaceae family which produces L-threonine and contains a mutation in the poxB gene, corresponding to SEQ ID No. 4.